REMARKS

This communication responds to the Office Action mailed on August 10, 2006. Claims 1, 8, 13, and 18 are amended, no claims are canceled, and no claims are added. As a result, claims 1-21 are now pending in this Application.

§*103 Rejection of the Claims*

Claims 1-6, 8-11, 13-18, and 20-21 were rejected under 35 USC § 103(a) as being unpatentable over Murdocca, Miles J., ("Principles of Computer Architecture," Prentice Hall, Upper Saddle River, NJ, pp. 270-273 and p. 312 (2000); hereinafter "Murdocca") and further in view of Herrell et al. (U.S. 5,301,287; hereinafter "Herrell"). Claim 7 was rejected under 35 USC § 103(a) as being unpatentable over Murdocca in view of Herrell and further in view of Olarig (U.S. 6,662,272; hereinafter "Olarig"). Claim 12 was rejected under 35 USC § 103(a) as being unpatentable over Murdocca in view of Herrell and further in view of Odom (U.S. 6,941,390; hereinafter "Odom"). Claim 19 was rejected under 35 USC § 103(a) as being unpatentable over Murdocca in view of Herrell and further in view of Blumrich et al. (U.S. 5,659,798; hereinafter "Blumrich"). The Applicant does not admit that Murdocca, Herrell, Olarig, Odom, or Blumrich are prior art, and reserves the right to swear behind these references in the future. And, since a *prima facie* case of obviousness has not been established as required by M.P.E.P. § 2142, the Applicant respectfully traverses this rejection.

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d (BNA) 1596, 1598 (Fed. Cir. 1988). The M.P.E.P. contains explicit direction to the Examiner in accordance with the *In re Fine* court:

> In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 1991)).

The requirement of a suggestion or motivation to combine references in a *prima facie* case of obviousness is emphasized in the Federal Circuit opinion, *In re Sang Su Lee*, 277 F.3d 1338; 61 U.S.P.Q.2D 1430 (Fed. Cir. 2002), which indicates that the motivation must be supported by evidence in the record.

No proper *prima facie* case of obviousness has been established because (1) the proposed combinations do not teach all of the limitations set forth in the claims, (2) there is no motivation to combine the references, and (3) the proposed combinations provide no reasonable expectation of success. Each of these points will be detailed below.

The proposed combinations will not render all claimed elements: As admitted by the Office, Murdocca "fails to teach passing a virtual address pointer to DMA module." The Office goes on to assert that "Herrell teaches passing virtual pointer to DMA device". However, Herrell does not teach "passing a virtual address pointer associated with the subset of the range of virtual addresses to *a direct memory access module to access the subset of the range of physical addresses by the direct memory access module without translating the virtual address pointer*" (claims 1 and 8), or "a direct memory access module to receive a virtual pointer to a subset of a range of virtual addresses that is identity-mapped to the range of physical addresses and to transfer data between the range of physical addresses and a peripheral memory *using a direct memory access operation without translating the virtual pointer*" (claim 13), or "a virtual pointer associated with the subset is to be received by the direct memory access module to implement *a direct memory access operation without translating the virtual pointer*" (claim 18).

This is because Herrell depends on the DMA processor 222 to translate the virtual addresses it receives into physical addresses before they can be used. That is, the "… DMA processor 222 then … translates the virtual pointer to a physical address which is then written to DMA state machine 223." Herrell, Col. 8, lines 5-9. The only time such translation does not occur is when the host CPU 20 sends command/data (C/D) packets (instead of command/pointer (C/P) packets) to the DMA processor 222, such that no virtual pointer is transmitted. *See* Herrell, Col. 8, lines 44-49.

Virtual pointer translation is not used in the embodiments claimed by the Applicant because virtual addresses are identity mapped to the physical addresses by the Operating System.

For example, using the claimed embodiments, the "… caller can then store the data in this allocated area and pass the pointer to the DMA engine driver. The DMA engine driver may then fill the descriptor using this pointer and pass it on to the DMA engine for data transfer." Application, pg. 5, lines 9-12. No combination of Herrell with Murdocca, Olarig, Odom, and/or Blumrich can provide this type of operation.

There is no motivation to combine the references: The claims are also nonobvious because the test for obviousness under § 103 must take into consideration the invention as a whole; that is, one must consider the particular problem solved by the combination of elements that define the invention. *See Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) (emphasis added). References must be considered in their entirety, including parts that teach away from the claims. See MPEP § 2141.02.

No proper *prima facie* case of obviousness has been established because Herrell teaches away from any combination that uses a virtual pointer for DMA operations without translation. As noted by Herrell:

> "... the term VDMA is really only useful to denote that the original source of the address for the DMA was a virtual address. The VDMA host interface 22 of the invention must be capable of using virtual address to obtain the data associated with a graphics primitive. Therefore, the DMA processor 222 in accordance with the invention has its own virtual to physical translation capabilities …". Herrell, Col. 7, lines 54-57 and Col. 8, lines 51-56.

The proposed combinations provide no reasonable expectation of success: Even if the proposed combinations are made, no reasonable expectation of success arises. This is because Herrell mandates translation of the virtual pointer by the DMA device. Thus, one of ordinary skill in the art would not expect that combining Herrell with any of the other cited references would produce the claimed embodiments.

In summary, the references neither teach nor suggest the existence of "passing a virtual address pointer associated with the subset of the range of virtual addresses to *a direct memory access module to access the subset of the range of physical addresses by the direct memory access module without translating the virtual address pointer*" (claims 1 and 8), or "a direct memory access module to receive a virtual pointer to a subset of a range of virtual addresses that

is identity-mapped to the range of physical addresses and to transfer data between the range of physical addresses and a peripheral memory *using a direct memory access operation without translating the virtual pointer*" (claim 13), or "a virtual pointer associated with the subset is to be received by the direct memory access module to implement *a direct memory access operation without translating the virtual pointer*" (claim 18). Thus, independent claims 1, 8, 13, and 18 are nonobvious. All dependent claims are also nonobvious, since any claim depending from a nonobvious independent claim is also nonobvious. See M.P.E.P. § 2143.03.

Further, there is no motivation to combine the references, and no reasonable expectation of success arises if the proposed combinations are made. Thus, the requirements of *M.P.E.P.* § 2142 have not been satisfied; and a *prima facie* case of obviousness has not been established with respect to the Applicant's claims. It is therefore respectfully requested that the rejection of claims 1-21 under 35 U.S.C. § 103 be reconsidered and withdrawn.

CONCLUSION

The Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone the Applicant's attorney at (210) 308-5677 to facilitate prosecution of this Application. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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